

Response under 37 C.F.R. §1.111
Attorney Docket No. 010819
Serial No. 09/891,511

REMARKS

Claims 1-16 and 60 were canceled without prejudice or disclaimer of the subject matter recited therein. Claims 17-59 were withdrawn from consideration. Claims 61-71 were previously presented. Claims 17-59 and 61-74 are currently pending. Claims 72-74 have been added herein. Claims 61, 64 and 66-67 have been amended herein. Support for the new claims and amendments, is set forth below.

Applicants' Response to the Rejections under 35 U.S.C. §103(a)

Currently, claims 61-71 stand rejected under 35 U.S.C. §103(a) as being unpatentable over cited prior art. Specifically, claim 64 is rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,665,968 to Meisburger et al. in view of U.S. Patent No. 5,973,323 to Adler et al. Meisburger et al. Claims 65 and 66 are rejected under 35 U.S.C. §103(a) as being unpatentable over Meisburger et al. and Adler et al. as applied to claim 64 above, and further in view of U.S. Patent No. 5,944,049 to Beyer et al. Claims 61 and 62 are rejected under 35 U.S.C. §103(a) as being unpatentable over Meisburger et al. and Adler et al. as applied to claim 64 above, and further in view of U.S. Patent No. 6,315,512 to Tabrizi et al. and U.S. Patent No. 5,536,128 to Shimoyashiro et al. Claims 63, 67, and 71 are rejected under 35 U.S.C. §103(a) as being unpatentable over Meisburger et al., Adler et al., Tabrizi et al., and Shimoyashiro et al. as applied to claims 61 and 62 above, and further in view of Beyer et al. as applied to claims 65 and 66 above. Claim 68 is rejected under 35 U.S.C. §103(a) as being unpatentable over Meisburger et al., Adler et al., Tabrizi et al., and Shimoyashiro et al., and Beyer et al. as applied to claims 63, 67, and 71 above, and further in view of U.S. Patent No. 4,911,103 to Davis et al. Claim 69 is rejected under 35 U.S.C. §103(a) as being unpatentable

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over Meisburger et al., Adler et al., Tabrizi et al., and Shimoyashiro et al., and Beyer et al. as applied to claims 63, 67, and 71 above, and further in view of U.S. Patent No., 6,344,750 to Lo et al.

In response thereto, applicants have amended independent claims 61, 64, 66-67 to more distinctly claim the subject matter regarded as the invention. Specifically applicants have defined the following features A) and B) in the independent claims to clearly distinguish them from the cited references.

- A) "wherein said beam generating means comprises a thermal electron beam source including LaB₆ as a cathode, the tip portion of which is formed into a cone shape or a truncated cone shape;" and,
- B) "wherein said electron optical system includes a primary optical system having a multi-stage multi-pole lens system and forming the telecentric electronic optical system for providing the Koehler illumination"

Applicants respectfully submit that the cited references do not disclose these features of the amended claims.

In the claimed invention, a thermal electron beam source including LaB₆ as a cathode is employed in a beam generating means or an electron beam source and the tip portion of the cathode is formed into a cone shape or a truncated cone shape.

In a case where a relatively large area (for example, 100 x 25 to 400 x 100 μm^2) is to be irradiated with a high current (e.g. in the order of 1 μA), a thermal electron source using a cathode LaB₆ should be employed. The tip portion of the cathode is formed into a cone shape or a truncated cone shape. By this arrangement, irradiation with a high current and high emittance is obtained in irradiation over a relatively large area. (see page 90 line 20 – page 91 line 8).

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Also, in the claimed invention, the electron optical system includes a primary optical system having a multi-stage multi-pole lens system. The multi-pole multi-stage lens, e.g. 4-pole 3 stage lens system as explained in an embodiment of the text, has a stronger focusing effective than a rotationally symmetrical lens, and thereby the aperture aberration corresponding to the spherical aberration of the rotationally symmetrical lens can be corrected by applying an appropriate voltage to the aperture aberration correcting electrode. Thereby, a uniform plane beam can be irradiated over a specified region (see page 92 lines 9-20).

In addition, by adopting the telecentric electronic optical system which provides the Koehler illumination, the primary beam is formed to be a parallel beam, and is irradiated uniformly and similarly against the object to be inspected. (see page 101 lines 20-26).

Thus, an aberration generated in the electron optical system is corrected and a uniform irradiation over an relatively large area can be obtained.

These features are neither taught nor suggested by any of the cited references at al.

Sine each of the independent claims include these features A) and B), which are neither disclosed nor suggested in any of the cited references and have patentability over them, applicants respectfully submit that the subject application should be allowed.

In view of the aforementioned amendments and accompanying remarks, Applicants submit that that the claims, as herein amended, are in condition for allowance. Applicants request such action at an early date.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney to arrange for an interview to expedite the disposition of this case.

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If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

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